

The Herbarium and Arboretum of the Forest Research Institute of Malaysia at Kepong — a Historical Perspective

K.M. WONG

Forest Research Institute of Malaysia, Kepong, Selangor, Malaysia.

Abstract

The beginnings of the Herbarium and Arboretum of the Forest Research Institute of Malaysia at Kepong are documented, as are the roles of the people associated with these events and developments from British colonial times until Malayanisation in the 1960s. The Herbarium was founded by Alfred M. Burn-Murdoch, the first Chief Forest Officer of the Straits Settlements and Federated Malay States, in 1908. The Arboretum was begun in 1928-29, with James Watson (Forest Economist) and Frederick Foxworthy (Forest Research Officer) playing significant roles in its establishment. The influence of the government of the Straits Settlements and Federated Malay States and the roles of Burn-Murdoch, Foxworthy, Watson, Symington and Wyatt-Smith, likewise of their colleagues and associates, in the development of botanical studies in Malaya are traced from the beginning of the 20th Century, through military occupation during the Second World War, until the 1960s.

Prologue

Early notions of placing the guardianship of the forests of the Malay Peninsula under a more systematic arrangement may be traced to the time of the Straits Settlements, a British Crown Colony consisting of Malacca, Penang, Province Wellesley, Singapore, Pangkor and the Sembilan Islands. It was in 1879 that the Colonial Engineer of the Straits Settlements, Major J.F.A. McNair, provided the earliest record of forestry in a report that supplied descriptions of the main timber trees and which recommended the formation of a forest department. It was not until 1883 that a small department of forests in Singapore was created under the Superintendent of Gardens, Straits Settlements, which position was held by Nathaniel Cantley from 1880 until his death in 1888.

In 1895, when the states of Perak, Selangor, Negri Sembilan and Pahang formed the Federated Malay States (each of which had a British Resident), the control of forests in the Straits Settlements was transferred from the Director of Gardens to the State Land Officers, as was the practice in the Federated Malay States. Henry Nicholas Ridley (who succeeded Cantley), pointed out that this was not a satisfactory arrangement for looking after all matters pertaining to forests. In a report on the forests of Selangor in 1896 he thus recommended the establishment of a forest department for the Federated Malay States (Mead 1936; Watson 1950). H.C. Hill, commissioned in 1900 from the Indian Forest Service to report on forest administration in the Straits Settlements and Federated Malay States, recommended the appointment of a Chief Forest Officer to take charge of forests (Hill 1900a, 1900b). This resulted in the transfer of Alfred M. Burn-Murdoch from the Burma Forest Service in 1901 to the post of Chief Forest Officer of the Straits Settlements and Federated Malay States.

The Beginnings of the Herbarium

Burn-Murdoch had, from 1901 (the year he arrived in Malaya) until his death in Klang in 1914 (Anon. 1914), recognised the relevance of producing an account of

commercially important timber tree species of the Malay Peninsula. It was, therefore, of direct concern to him to obtain first-hand knowledge of forest trees, and so he developed an interest in collecting plants as reference material. His earliest documented plant collections in Malaya date from 1903 (van Steenis-Kruseman 1950). From 1904, Burn-Murdoch's office was known as the Conservator of Forests, Straits Settlements and Federated Malay States. Burn-Murdoch (1909) recorded in the 1908 Annual Report of the Forest Department that "during the year, a collector of specimens was employed by the Conservator, who collected many herbarium specimens of forest trees ... submitted to Mr. Ridley ... for identification ..." and that "... a collection of the named specimens was commenced and ... kept in the office of the Conservator for ... reference."

In 1908, therefore, the Forest Department started a managed collection of pressed plant specimens that was to develop into the present herbarium of the Forest Research Institute of Malaysia at Kepong. Burn-Murdoch, the man who founded this herbarium, had himself travelled extensively in the field collecting plants in all states of present-day Peninsular Malaysia except Perlis, Kedah, Trengganu and Kelantan (Burkill 1915; van Steenis-Kruseman 1950). He distributed some of his collections to the herbaria of the Singapore Botanic Gardens and the Royal Botanic Gardens, Kew.

Burn-Murdoch was a person of tremendous energy; it is to his credit that the first reserved mangrove swamp forests were established for Perak and Selangor. His book, *Trees and Timbers of the Malay Peninsula* (Burn-Murdoch 1911, 1912), is the forerunner of forestry publications that form the series of Malayan Forest Records. Despite his primary interest in forest trees, Burn-Murdoch's collections encompassed other groups of plants, including shrubs, lianes, palms, parasites, saprophytes, ferns and aquatic herbs (Burkill 1915), a testimony to his wide interest in natural history.

At the beginning of 1915, the year following that of his death, the Forest Department herbarium consisted of 481 numbers, representing about 370 species (Foxworthy 1918), collected by both British serving officers as well as local forestry staff (many of these collectors were forest rangers) and accommodated in a single small cupboard at the Forest Department premises in the Supreme Court building on Court Hill in Kuala Lumpur. Under Burn-Murdoch's successor, G.E.S. Cubitt, accessions to this collection (often referred to as the "local herbarium" in departmental reports) continued, albeit slowly, and by early 1916 there were 500 numbers representing about 385 species (Foxworthy 1918). In 1916, the Wray herbarium of the Agriculture Department was transferred to the Forest Department in Kuala Lumpur (Cubitt 1919).

With the potential of forest resources and a rubber-dominated agriculture in Malaya becoming increasingly recognised, the scenario of the time saw a gradual de-emphasis of agri-horticultural and forestry organization in Singapore, where the Botanic Gardens had served the agro-economic development of the Straits Settlements since 1875, and its centralization in Kuala Lumpur, the administrative centre of the Federated Malay States (Furtado & Holttum 1960; Burkill 1983). In 1918, a desire was already crystallizing to intensify botanical research based in Kuala Lumpur where was housed the headquarters of the Department of Forests, Straits Settlements and Federated Malay States, and the Department of Agriculture, Federated Malay States. This was the year in which Cubitt secured the services of Frederick William Foxworthy as the first Forest Research Officer of the Federated Malay States and Straits Settlements, after which the size of the Forest Department's "local herbarium" was substantially increased. Very much a botanist, Foxworthy, upon his arrival in Malaya, spent a great deal of time acquainting himself with the local flora and vegetation, and rearranging both the Wray herbar-

ium (maintained separately) and the "local herbarium," identifying, labelling and recording a large amount of old and newly collected material (Cubitt 1919). Foxworthy had the assistance of I.H. Burkill in identification, and both Burkill and C.F. Baker, of the Singapore Botanic Gardens, together with Foxworthy and several Forest Department staff members, became the main contributors to this collection (Cubitt 1919). Foxworthy also distributed duplicates of plant collections to Singapore and Kew (Cubitt 1919), from what was now called the Forest Herbarium, housed in the same premises at Kuala Lumpur's Court Hill.

Also in 1918, the Governor of the Straits Settlements (S.S.), Sir Arthur Young, who was also the High Commissioner to the Federated Malay States (F.M.S.), expressed to the Secretary of State for the Colonies the desirability of maintaining work in systematic and economic botany outside the proposed joint S.S. & F.M.S. Department of Agriculture. By December, 1923, a forestry committee formed by Cubitt had met with A.S. Haynes, Secretary for Agriculture, S.S. & F.M.S., and I.H. Burkill, Director of Botanic Gardens, S.S., to discuss the centralization of botanical work in Malaya. They decided that the Singapore Herbarium, as well as work in systematic and economic botany carried out by the Singapore Botanic Gardens and the F.M.S. Museums Department, should be transferred to the premises of a new Botanical Department to be established in Kuala Lumpur. Furthermore, the Public Gardens in Kuala Lumpur was to be developed as a botanic garden, and the Penang and Singapore gardens were to function as branches. These plans, as explained by Burkill (1983) in some detail, were not translated into reality. The rubber slump of 1924 affected revenue adversely and Sir Lawrence Guillemard, then Governor/High Commissioner, did not overrule strong opposition from Sir George Maxwell, Chief Secretary to the F.M.S., against effecting the centralization of botanical research. Although Maxwell finally agreed, just before his retirement in 1926, to the establishment of a new department (to be known as Botanical Survey, Malaya) the S.S.-F.M.S. Government appears to have lacked any further impetus towards realizing these objectives. In 1926, the Wray herbarium, hitherto curated in the Forest Herbarium at Kuala Lumpur, was incorporated into the Singapore Herbarium (I.H. Burkill 1927; van Steenis-Kruseman 1950). H.M. Burkill (1983) records —

"In 1929, the world was perceptively sliding into another slump ... the Singapore Botanic Gardens continued to provide the botanical service Malaya needed. The Forest Department was particularly affected since a major aspect of tropical forestry is to be able to make reliable inventories of forest species. Failure to bring the resources of the Singapore Herbarium to Kuala Lumpur led to the setting up of specialist facilities within the Forest Research Institute, Kepong ..."

Under Foxworthy, the Forest Herbarium developed rapidly. By the end of 1919, the herbarium (excluding the Wray collection) contained some 5000 numbers representing 1700 species, of which about 1200 were trees (Cubitt 1920), and at the close of 1920, this had increased to 6000 numbers representing about 2100 species of which about 1600 were trees (Barnard 1921). Although Foxworthy is primarily remembered for his role in organizing the beginnings of forestry research in Malaya, his account of *The Commercial Woods of the Malay Peninsula* (Foxworthy 1921) is the first comprehensive work summarizing the botany of Malayan dipterocarps in a form suited to foresters. This publication began the Malayan Forest Records as its first number; his *Dipterocarpaceae of the Malay Peninsula*, issued as No. 10 of the same series (Foxworthy 1932), was the first plant systematic monograph produced at the newly established Forest Research Institute. It incorporated the results of contemporary revisionary work and set the stage for a more comprehensive treatment of this important timber family. Foxworthy had been a botanist with the Bureau of Science in Manila and held the same breadth of vision as Burn-Murdoch in the attention he gave to plant groups of lesser commercial



Plate 1. F.W. Foxworthy (1877-1950), the first Forest Research Officer of the Federated Malay States and Straits Settlements. His *Dipterocarpaceae of the Malay Peninsula*, published in 1932, was the first plant systematic monograph produced at the then newly established Forest Research Institute at Kepong.

importance. His account of *Minor Forest Products of the Malay Peninsula* (Foxworthy 1922) testifies to this, and in his annual report for 1923 (Foxworthy 1924) he noted: "The most serious lack about our herbarium at present is room ... the condition has become very acute with the beginning of our collection of rattans." In 1926, a number of bamboo specimens were identified by the specialist J.S. Gamble at Kew (Foxworthy 1927).

With Foxworthy as Forest Research Officer, the Forest Research Institute (FRI) was first functionally established at its present site at Kepong in 1926, when a forest nursery and several experimental plantations were begun. Although the decision to set up the FRI was first taken in 1921 it was not until August 1925 that the Regent of Selangor was approached to approve 800 acres at Kepong for the purpose, and only in 1929 was the main office building constructed (Anon. 1950b; Watson 1950; Menon 1969), and the Forest Herbarium moved from its original site to a room on the upper floor of the east wing of this building (Foxworthy 1930). The following year, Foxworthy noted (Foxworthy 1931) that "... the herbarium now contains material of about 70 percent of the known tree species of the Peninsula; ..." this was based on his earlier estimate (Foxworthy 1918) of about 2200 species of trees recorded from the Peninsula. During this formative period of the herbarium, in the latter years of the 1920s, there was a continuing spirit of cooperation between the Singapore Botanic Gardens and the F.M.S. Forest Department. Apart from the assistance of botanists based at Singapore, the Forest Department had also enlisted, in several assignments, the help of Mohamed Nur bin Mohamed Ghous, the Herbarium and Museum Assistant of the Singapore Botanic Gardens. Mohamed Nur was prominent among collectors who had accompanied Foxworthy in the field (Burkill 1958). Foxworthy retired in 1932, after which the post of Forest Research Officer was abolished and replaced by a conservatorship.

Watson and the Kepong Arboretum

The last years of the 1920s were significant in another respect. As the Forest Research Institute settled down in its new premises at Kepong, it was recognized that botanical and forestry research required the support of carefully planned living plant collections. Even though experimental tree plantations at Kepong were initiated in 1926, Foxworthy looked forward to the eventual specialised collections. In a memorandum to the Forest Economist, James Gilbert Watson (No. 3 in F.R.O. 189/27 dated 20th October 1927), Foxworthy wrote of palms: "A special place might be set aside for a collection of the tall growing palms. Fairly good soil will be needed and the plants should be set far enough apart to give them a chance to spread ..." In effect this must have been carried out, although there is no traceable record on where the "palm site" was; the oldest palm specimens to be found in the arboretum records are a Bayas (*Oncosperma horridum*) and a Nibong (*O. tigillarum*) planted much later in 1953, and today still standing side by side at the intersection of Arboretum Road with the Sungei (River) Kroh.

James Watson (son of William Watson, once Curator of the Royal Botanic Gardens, Kew) had had some practical experience at Kew as well as at Berlin when he studied forestry at Eberswalde in Germany. He joined the Forest Department in Malaya in 1913 as a Forest Officer and eventually succeeded Foxworthy to lead the Forest Research Institute in 1932. His *Malayan Plant Names* (Watson 1928a) and *Mangrove Forests of the Malay Peninsula* (Watson 1928b) had just appeared as Malayan Forest Records No. 5 and 6, respectively. In a note (No. 3 in F.E. 93/27 dated 23rd September, 1928) to Foxworthy, Watson volunteered to begin establishment of an arboretum:

"I should very much like the formation and care of this part of the Kepong scheme to be included in my duties on my return from leave, more particularly in view of my past experience in this class of work, and from the fact that I should be living in the middle of the area that it is proposed to dedicate to the purpose. I discussed the matter on several occasions with the Conservator (Mr. Cubitt) who is, I believe, substantially in favour of the principle on which I wish to work, and who pointed out the desirability of a representative collection in view of the impending transfer of botanical research from Singapore to K. Lumpur. When we discussed the subject a short time ago, I do not think that we were regarding it from the same angle. I should like, therefore, to present the case as it appears to me ...



Plate 2. J.G. Watson (1889-1950), Conservator in charge of the Research Branch of the Malayan Forest Service during 1932-1936. He was responsible for the establishment of the Arboretum of the Forest Research Institute at Kepong in 1929, when he was Forest Economist.

"My idea of an arboretum is essentially a well-grown and representative collection of trees ... maintained for purposes of reference and as a convenient source of seeds and herbarium material for exchange ... In other words, it is primarily a living herbarium and, as such, it should be arranged as systematically as is practicable.

"It is clearly impossible to provide the trees in such a collection with the conditions that they will meet with in nature, for it may be assumed that each has its peculiar optimum which is not likely to be found in open country covered with lalang [*Imperata cylindrica*], following exhaustion of the soil from root-crops, exposure, and the cumulative effects of Chinese vegetable gardening. Further, the wide spacing that must be adopted to allow the trees to develop, precludes any mutual shelter or natural enrichment of the soil for many years to come. It will be necessary ... to give them more attention than it is practicable or desirable to give to forest plantations.

"The growth of individual trees in an arboretum cannot be expected to provide data of much silvicultural value, though (particularly in the case of exotics) it may provide useful preliminary indications and forestall needless expenditure on ... species that are foredoomed to failure through unsuitability of climate ...

"Apart from its scientific values, an arboretum at Kepong will serve a very useful purpose in the way of advertisement and propaganda, for with it we can demonstrate our ability to grow trees at a price, and thereby emphasize the difficulties with which we are faced in the field. And, finally, there is the aesthetic aspect to be considered, and the desirability of ... encouraging the rapid and healthy growth of trees in the neighbourhood of the office and residential portions of the reserve ...

"It will not be possible to adopt a systematic grouping according to families (as I originally suggested) as supplies are likely to be too irregular ... but I suggest that one third of the area be definitely dedicated to the dipterocarps, and a small portion to exotics ... Belukar [secondary forest] forms, and trees that are commonly found and are easily accessible elsewhere at Kepong, will not ordinarily be planted, though they may be retained if they happen to be growing in the arboretum area. Generally speaking ... the commercial trees will take precedence if space is at all cramped ...

"But as ... it is not likely that funds will be available for planting this year ... I suggest, therefore, that the available seedlings in the nursery should be earmarked and listed, and that we content ourselves this year with marking out their positions in the field in order that planting may start at once in 1929."

In the ensuing years following establishment of the dipterocarp and non-dipterocarp sections of the Arboretum, departmental correspondence indicates an active pursuit of this goal by both Watson and Foxworthy. These two sections were to mature, many years later, into the two largest collections at Kepong, the dipterocarp collection being the finest in the world.

Symington

In 1929 Colin Fraser Symington joined the FRI (Forest Research Institute) as Assistant Conservator of Forests and began to assist in the running of the herbarium; in 1934 he was designated the first Forest Botanist. Symington had envisioned, in 1936, producing a foresters' tree manual comprising all the Malayan timber-producing families. However, it was obvious that much research in systematic botany was still required and that a great amount of instability still existed in the botanical nomenclature. He concentrated on, and became the authority on the Dipterocarpaceae, the most important timber-tree family in Malaya and SE. Asia.

Symington completed his *Foresters' Manual of Dipterocarps* (No. 16 of the Malayan Forest Records) at Kepong in 1940. In November, 1941, typesetting of the book had begun at the Caxton Press in Kuala Lumpur but by the following month, both Symington and the manager of the press were forced to retreat to Singapore in the face of the Japanese invasion. In January 1942, Symington with his family boarded a ship for Australia (Corner 1981). At Singapore, E.J.H. Corner, Assistant Director of the Singapore Botanic Gardens, learnt from Mrs. Symington that the typescript had been left with the printer in Kuala Lumpur, but he was not successful in persuading Symington to leave a second copy at the Singapore Herbarium. Symington's important work on the Dipterocarpaceae would have been lost during the War, were it not for the timely initiative of Corner (then confined with other staff members to the Gardens), who informed Hidezo Tanakadate, then acting Director of Raffles Museum in occupied Singapore, of the typescript left in Kuala Lumpur. Tanakadate, a professor at the Tohoku Imperial University of Sendai, understood the value of Symington's work and intervened in a similarly timely manner. He obtained the release of H.E. Desch (who had worked closely with Symington at Kepong, and was author of *The Timbers of the Dipterocarpaceae*, No. 14 of the Malayan Forest Records) from the Changi Military Camp. Tanakadate and Desch travelled to Kuala Lumpur to find the galley proofs of the manual kept partly at the Caxton Press by L.E. Labrooy (Desch 1962) and partly at the FRI, Kepong (Tanakadate 1943). The proofs were corrected by Desch



Plate 3. C.F. Symington (1905-1943), designated the first Forest Botanist in the Forest Research Institute at Kepong in 1934. He was forced to flee Malaya in 1942 in the advent of war, and died in Nigeria the following year.

in Singapore at the Museum and the Changi PoW Camp, and the botanical names were scrutinised by Corner in the Gardens. The cost of printing 500 copies of Symington's manual (Symington 1943), at the Caxton Press in Kuala Lumpur, was met personally by Tanakadate and the Marquis Yositika Tokugawa, then acting President of the Raffles Museum and Library (Corner 1946). The book appeared under the Japanese title of *Malai Hanto no "Dipterocarpaceae" Mokuzai no Hokoku*, and was priced at 10 yen.

MALAI HANTŌ NO "DIPTEROCARPACEAE"
MOKUZAI NO HŌKOKU

MALAYAN FOREST RECORDS

No. 16

FORESTERS' MANUAL OF DIPTEROCARPS

by

C. F. SYMINGTON



PRICE 10 YEN

Published by Syonam-Hakubutsukan
Printed by, Carton Press Limited,
Kuala Lumpur, 2003.

Plate 4. The cover of the original issue of Symington's *Foresters' Manual of Dipterocarps*, issued by the Japanese Administration in Singapore in 1943.

It is a credit to the scientific community that men like Tanakadate could in time of war and hostility write: "scientific literature should not be obstructed by war" (Tanakadate 1943). In spite of Symington's departure from occupied Malaya, and the events that led to the publication of his book, the FRI was never to have back the botanist whose monograph of the Dipterocarpaceae was to become one of the best known works in Malayan botany. Symington returned to England and was posted to the forestry service in Nigeria where, in desperation, he took his own life in 1943, unaware of the fate of his book.

The War Years at the Ringyo Shikenjyo

After war broke out on 8th December, 1941, there were no resident British officers in charge at the Forest Research Institute, which the Japanese called the "Ringyo Shikenjyo" (Forestry Experimental Station). V.L. Bain, by virtue of being Eurasian, was exempted from detention and appointed the acting State Forest Officer for Selangor by the Japanese Military Administration. Bain was able to reappoint several local staff members at Kepong in 1942. Aziz bin Budin, Technical Assistant to the Herbarium, reappointed in April 1942, was put in charge of the Botanical Division of the Institute. Aziz reported for 1942 —

"During the former regime 78 herbarium cases were filled with herbarium sheets ... The looters have done considerable damage to this section. They removed almost all the cases, throwing all the valuable specimens on the floor. Some sheets were also taken away ... The herbarium, a room of 33 ft by 50 ft, was completely filled with mounted herbarium sheets filled to a foot depth. In addition to this the looters removed four copper heads of the laboratory taps, thus letting water to overflow the room. The result was that most of the herbarium sheets were soaked completely ... Those sheets which were beyond salvage, were discarded ...

"It is estimated that about $\frac{2}{3}$ of the original specimens of 43,000 sheets will be saved ..."

The plundering of the herbarium by looters was a grim prologue to the uncontrolled felling of forests for timber and food-growing that was beginning during those war years.

In September 1942, Yukio Tsuji was despatched by the Japanese Military Administration in Malaya to serve as the Chief Research Officer of the Forest Research Institute at Kepong. Tsuji graduated from the Department of Forestry of Tokyo University in 1919 and had been a research officer in the Japanese Government Forest Experiment Station (known as the Forestry and Forest Products Research Institute since 1958) before his appointment in Malaya. He remained in charge of the Forest Research Institute at Kepong until the end of the War.

In his programme of reorganization of the herbarium, Aziz wrote —

"All strewn herbarium sheets comprising nearly 30,000 in all to be critically examined, identification supplied from herbarium registers and finally to be distributed to their various family group. Each family is further to be ... rearranged into genus and species alphabetically ... kept in the herbarium cases, at present 24 cases in all ... all salvaged sheets to be dried individually ... Naphthalene flakes or Paradichlor benzene to be kept in the cases ... If index cards are available each herbarium sheet is to be indexed."

Aziz noted that "missing sheets [were] to be replaced either by duplicates or by new collection" and in fact during the year made collecting trips to Sungei Buloh, Bukit Bruang, Bukit Lanjan and the Central Experimental Station at Serdang, with the assistance of Forest Guards Sow bin Tandang and Tachun bin Baba, who were reengaged in August. Sow had worked the previous twelve years together with Symington. Aziz's report for 1943 seemed less desperate:

"Identifications were supplied to the Forest Department, majority of the requests were to identify some of the Commercial Timber-trees of Malai [Malaya] ... Routine identifications ... has taken up a disproportionate portion of the Technical Assistant's time ...

"Some 46 mounted duplicates were sent to the State Forest Officer, Kelantan, as a guide to the identification of trees ... Some specimens were also ... forwarded to the Navy Department, Syonan-to [Singapore] ...

"The Technical Assistant together with one of the collectors accompanied the Director of Forestry, on his inspection tour of Klang, where swamp jungle was studied.

"Acquisition of herbarium material during the year totalled 312 ... The figure seemed very small indeed as compared to the past years ..."

"Several Nippon Officers visited the Herbarium during the year — and some have spent good time in studying plants of commercial utility."

The visiting Nippon officers referred to in Aziz's report included Professor Ryujiro Ishida, who was despatched to survey research organisations in Malaya in 1943. Together with another officer named Utsuki, Ishida visited the Forest Research Institute at Kepong on 17 April 1943. He subsequently wrote a report on 14 organisations he visited, including the Wood Technology Laboratory in Kuala Lumpur and the Rubber Research Institute.

Watson, who succeeded Foxworthy as Conservator in charge of the Research Branch of the Malayan Forest Service in 1932, and later, J.P. Mead as Adviser on Forestry in October 1940 had retreated to Singapore with the advent of war and was interned when Singapore fell on February 15th, 1942 to Japanese hands. He was to spend three and a half years as internee, first at Changi Prison and then at Sime Road (Anon. 1950a). Most of the remaining officers of the Forest Service who had not left Singapore were also interned or were prisoners-of-war, until the surrender of the Japanese on August 15th, 1945. Bain, as acting State Forest Officer for Selangor, had appointed J.S. Wijasuriya as the Chief Clerk of the Forest Research Institute, who took charge of the Institute during this dismal period since 28th July, 1942. Thus, Wijasuriya, together with Technical Assistants P.K. Balan Menon and Aziz Budin, both reengaged along with 3 clerks and a skeleton team of subordinate field staff and labourers, went about the business of reorganizing and maintaining the facilities and work as best as possible under the clouds of war.

By the end of the War, the area under experimental plantations on the Institute's premises was reduced from 494 to 377 acres. Of a total of 363 trees in the arboretum, 97 were felled or damaged irreparably by fire.

From War to Malayanisation

There was no hiatus following the cessation of war in Malaya in the August of 1945. Reassessment and rebuilding had to begin. Watson returned to serve as Forestry Adviser to the Colonial Office during 1946-47 before retiring (Anon. 1950a) and F.H. Landon was placed in charge of the Institute from 1946 to 1948 (Menon 1969). The herbarium came under the charge of John Wyatt-Smith, who served as Forest Botanist between November 1946 and May 1955. The Forest Herbarium at Oxford University returned to Kepong herbarium, as a gift, its duplicate material of specimens from the Kepong collection that were lost in the war. Field collection of specimens regained momentum. In 1949 the herbarium was rearranged (Anon. 1950c) according to the classification of Bentham & Hooker's *Genera Plantarum*; this system has been retained as the basic framework of classification since then. With the publication of *Index Herbariorum* in 1952 (Lanjouw & Stafleu 1952), the FRI herbarium, Kepong, adopted KEP as its acronym.

Although in full realization that a companion volume to Symington's *Dipterocarpaceae Manual* was essential, in that similar information on timber trees of other families were needed, Wyatt-Smith was aware that the state of knowledge and systematy of these other plant families could only be advanced gradually. He thus produced a series of illustrated notes on the Burseraceae, Leguminosae, Myristicaceae, Sapotaceae, Lauraceae and Sapindaceae (Wyatt-Smith, 1953-54) that could

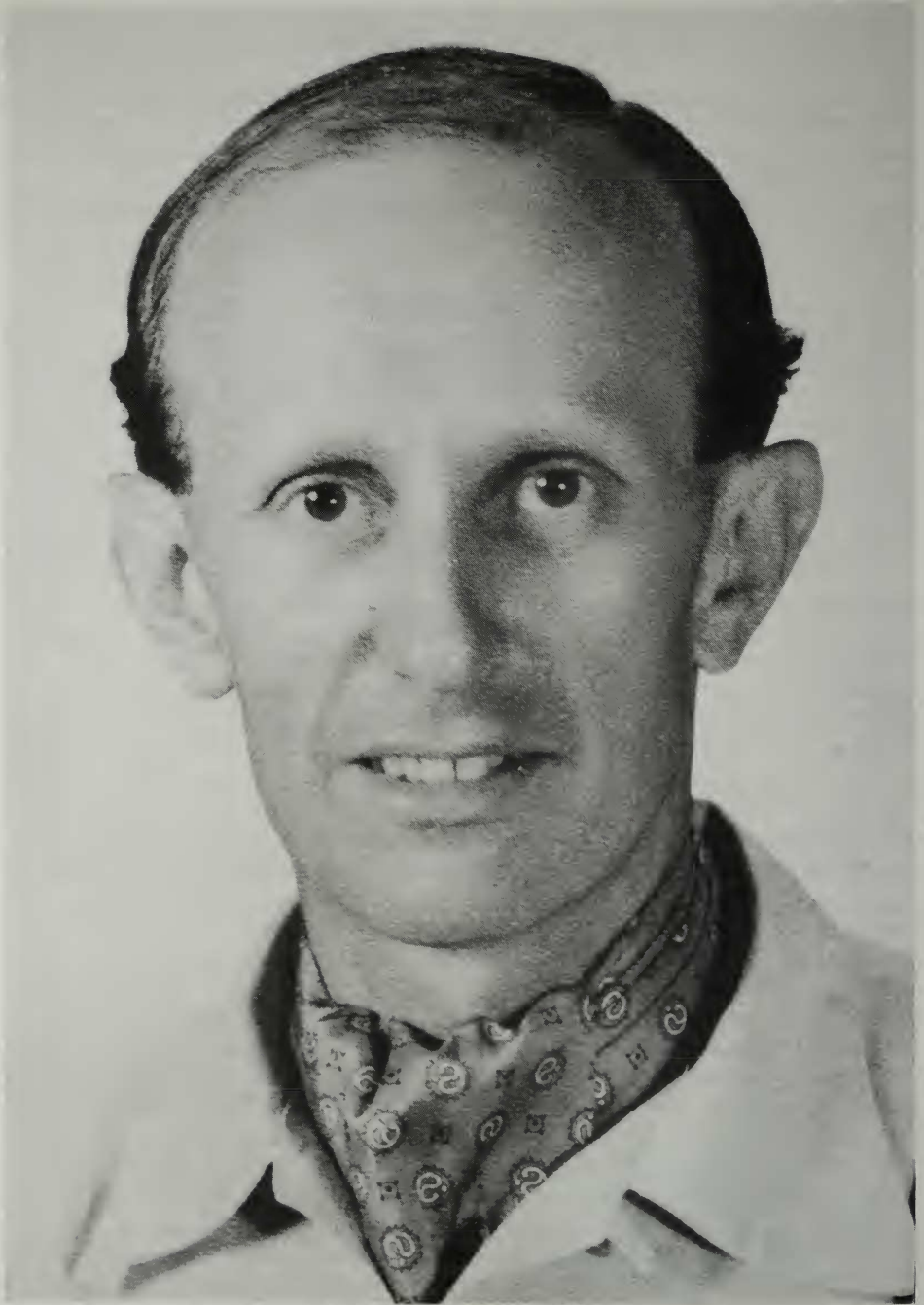


Plate 5. J. Wyatt-Smith (b. 1917), Forest Botanist at the Forest Research Institute at Kepong during 1946-1955, was later Forest Ecologist and Forest Silviculturist for some years.

serve as preliminary accounts and simultaneously would be of practical use to foresters. Wyatt-Smith also worked with M.R. Henderson, then Director of the Singapore Botanic Gardens, on revising the difficult genus *Calophyllum* for Malaya (Henderson & Wyatt-Smith 1956). Such efforts, however, were interrupted.

Wyatt-Smith's tenure as a forest botanist in the widest sense of the term saw him first as Forest Botanist (November 1946 — May 1955, since 1951 as Forest Botanist and Ecologist), then after a period of leave as Forest Ecologist (Botany) (Septem-

ber 1958 — 1959) and subsequently as Forest Silviculturist (1959 — April 1963). The nature of these various posts reflected a renewed emphasis on silvicultural research and practices. Between 1950 and 1954, Wyatt-Smith and R.C. Barnard (the latter then Silviculturist) were put mainly in charge of producing a contemporary manual of silviculture which was the first priority of the Silvicultural Division. Although Barnard had published a preliminary treatment of the main scope of silvicultural work (Barnard 1954), he retired in 1956 by which time Wyatt-Smith had been transferred on field duty to Kedah as its State Forest Officer. In 1957, G.G.K. Setten, then Chief Research Officer, petitioned for the return of Wyatt-Smith to complete the manual of non-dipterocarps and of J.E. Cousens, formerly Instructor of the Forest School at Kepong, to complete the manual of silviculture. But Cousens left the Forestry Service in 1958 and circumstances dictated the transfer of Wyatt-Smith from botany to silviculture (Mohammed Alwy, foreword in Wyatt-Smith 1963).

If botanical work towards the non-dipterocarp manual of timber trees was interrupted by these circumstances, it also amply displayed the relevant association between forest botany, ecology and silviculture. With broad perceptions accruing from much field experience in these areas, Wyatt-Smith published the bulk of the work in his manual of silviculture (Wyatt-Smith 1963). His ecological research plots at Bukit Lagong and Sungei Menyala, set up in 1947, were to become, decades later, among the oldest study plots in the tropical world.

With the approach of the formation of the Federation of Malaya and thereafter the Federation of Malaysia in 1962, the transition towards Malayanisation came into being. Kizhakkedathu Mathai Kochummen, working with Wyatt-Smith as Research Assistant from January 1953 to May 1955, and Assistant Botanist from June 1955 to June 1971, took sole charge of the herbarium during 1960-63. The targetted deadline for Malayanisation of the Research Branch was 1965. In 1963, G.G.K. Setten, the last expatriate Chief Research Officer, left and was succeeded by Abdul Rahman bin Mohamad Ali. The last foreigners to leave the Forest Research Institute were A.J. Vincent, Deputy Chief Research Officer, and B.A. Mitchell, Afforestation Officer. Francis S.P. Ng was recruited in June 1964 as Forest Botanist.

When an extension to the main office building was completed in 1965, the herbarium moved, in May, to the top floor of the new block. By 1965, the collection numbered 74,694 specimens. With this new scheme of things, and Kochummen and Ng attached to Forest Botany, the non-dipterocarp manual was again reemphasized and Timothy Charles Whitmore was engaged under the Colombo Plan Aid to reorganize the project to produce a *Tree Flora of Malaya*. Whitmore was with the FRI between September, 1965 and April, 1972. Kochummen became Forest Botanist in 1971 and Senior Forest Botanist in 1980, and Ng was Senior Forest Botanist from 1974 until 1978, subsequently assuming the post of Assistant Director of the Institute. The first volume of the *Tree Flora of Malaya* (Ed. Whitmore 1972), largely written by Kochummen, Whitmore and Ng, also received contributions of family accounts from other botanists in the region, viz. Peter F. Cockburn, Hsuan Keng and Benjamin C. Stone.

The development of the Herbarium and Arboretum subsequent to Malayanisation, and the individual achievements of Kochummen and Ng, are not here dealt with. The present account chronicles the beginnings of the Herbarium and Arboretum of the present Forest Research Institute of Malaysia at Kepong, and traces the roles of the people associated with these events and developments until Malayanisation in the late sixties.

Acknowledgements

I thank the following for providing helpful comments and information: Mr. H.M. Burkill, Dr. K.L. Chang, Professor E.J.H. Corner, Dr. J. Dransfield, Professor R.E. Holtum, Mr. K.M. Kochummen, Mr. T. Matsumoto, Dr. F.S.P. Ng and Dr. T.C. Whitmore. I am grateful to Khoon Cheong for assistance during the preparation of the manuscript.

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